

No. 765,709.

PATENTED JULY 26, 1904.

W. J. PERKINS.
EXHAUST MUFFLER.

APPLICATION FILED MAR. 13, 1903.

NO MODEL.

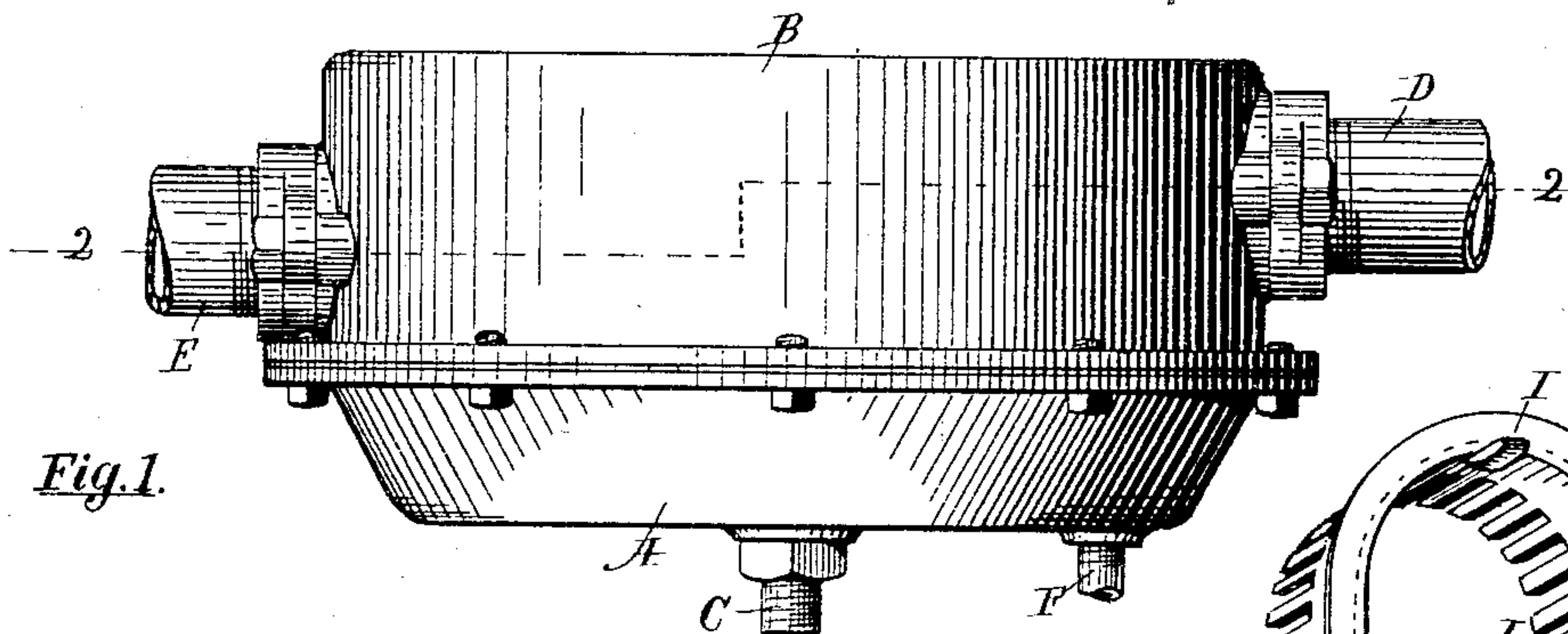


Fig. 1.

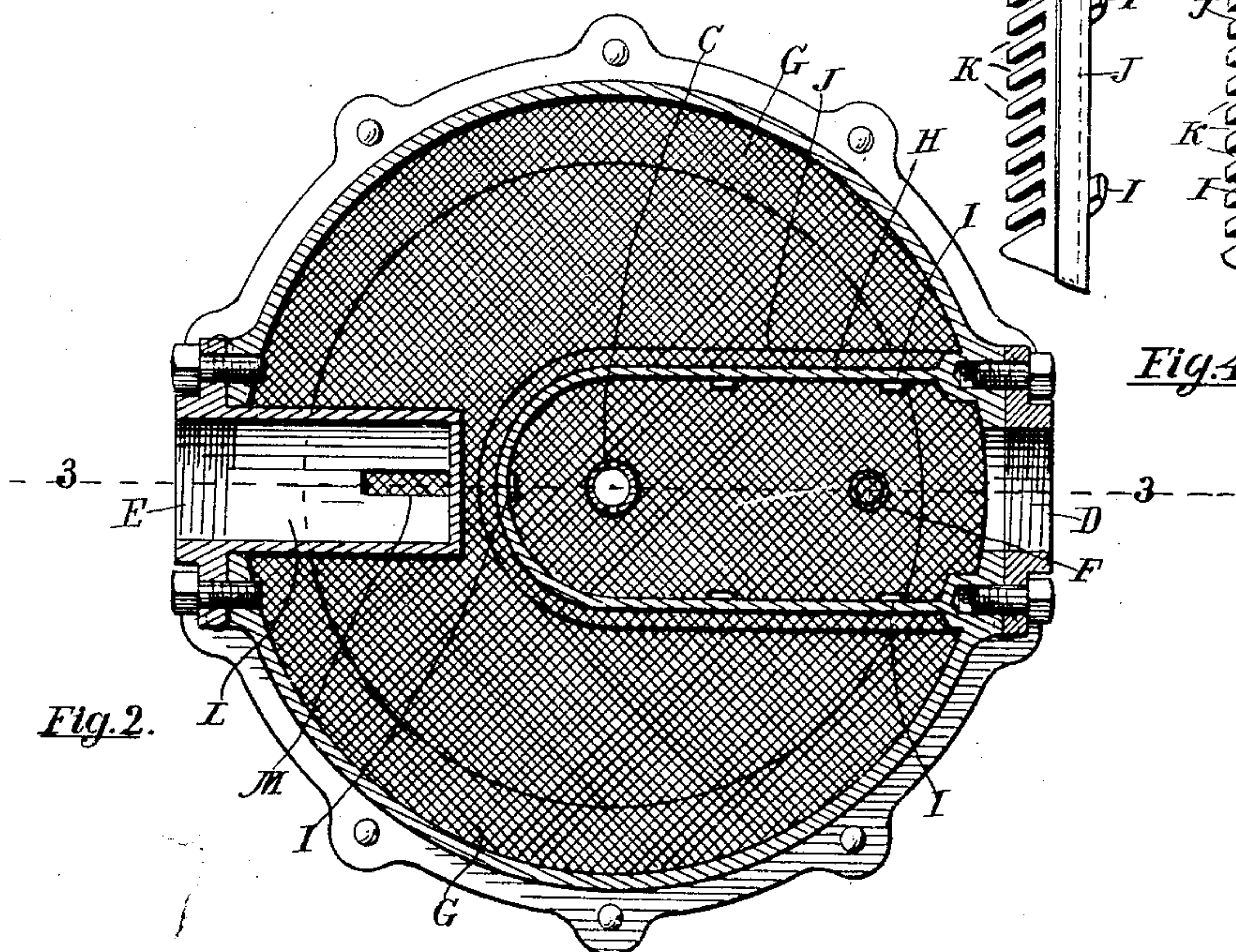


Fig. 2.

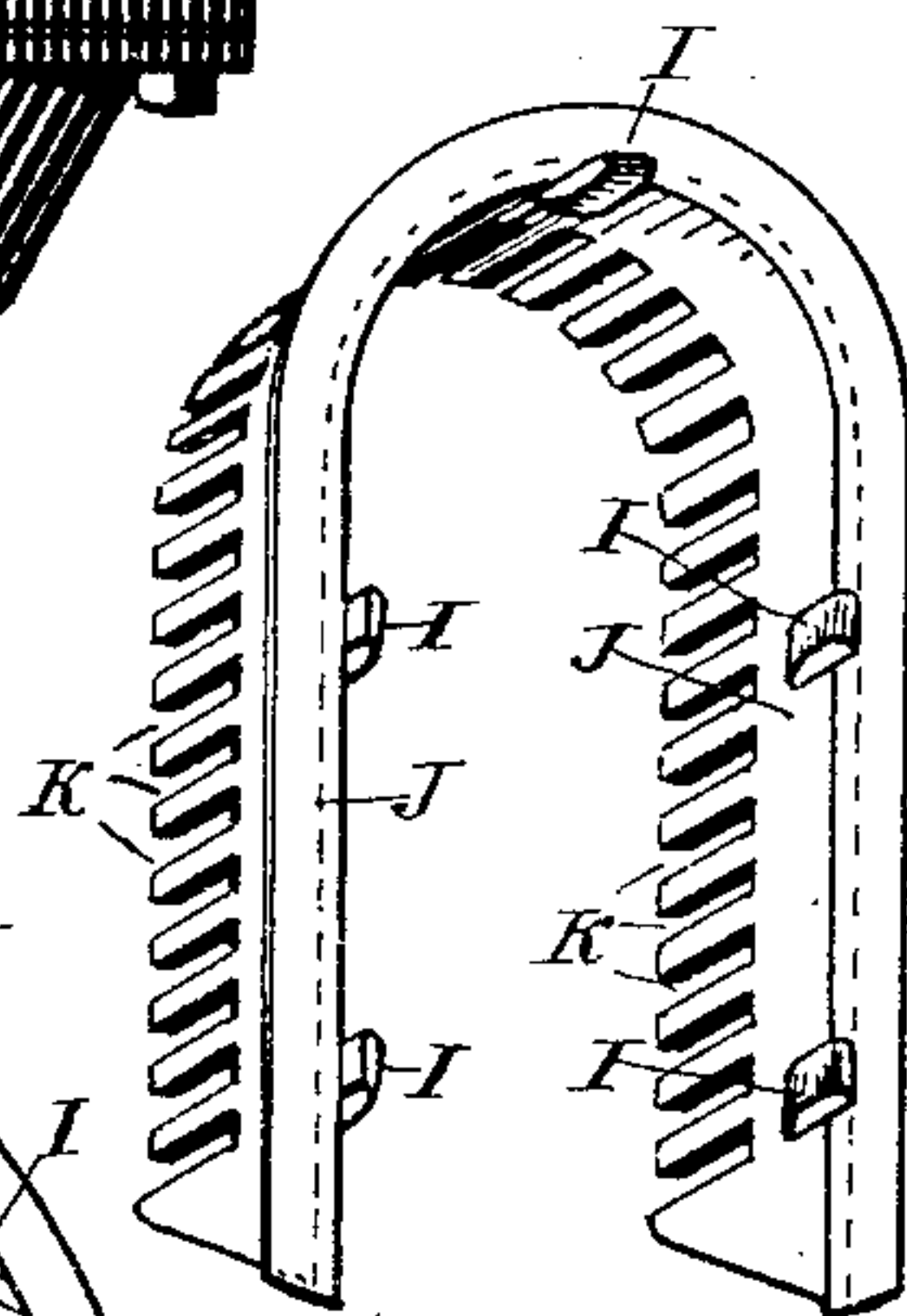


Fig. 4.

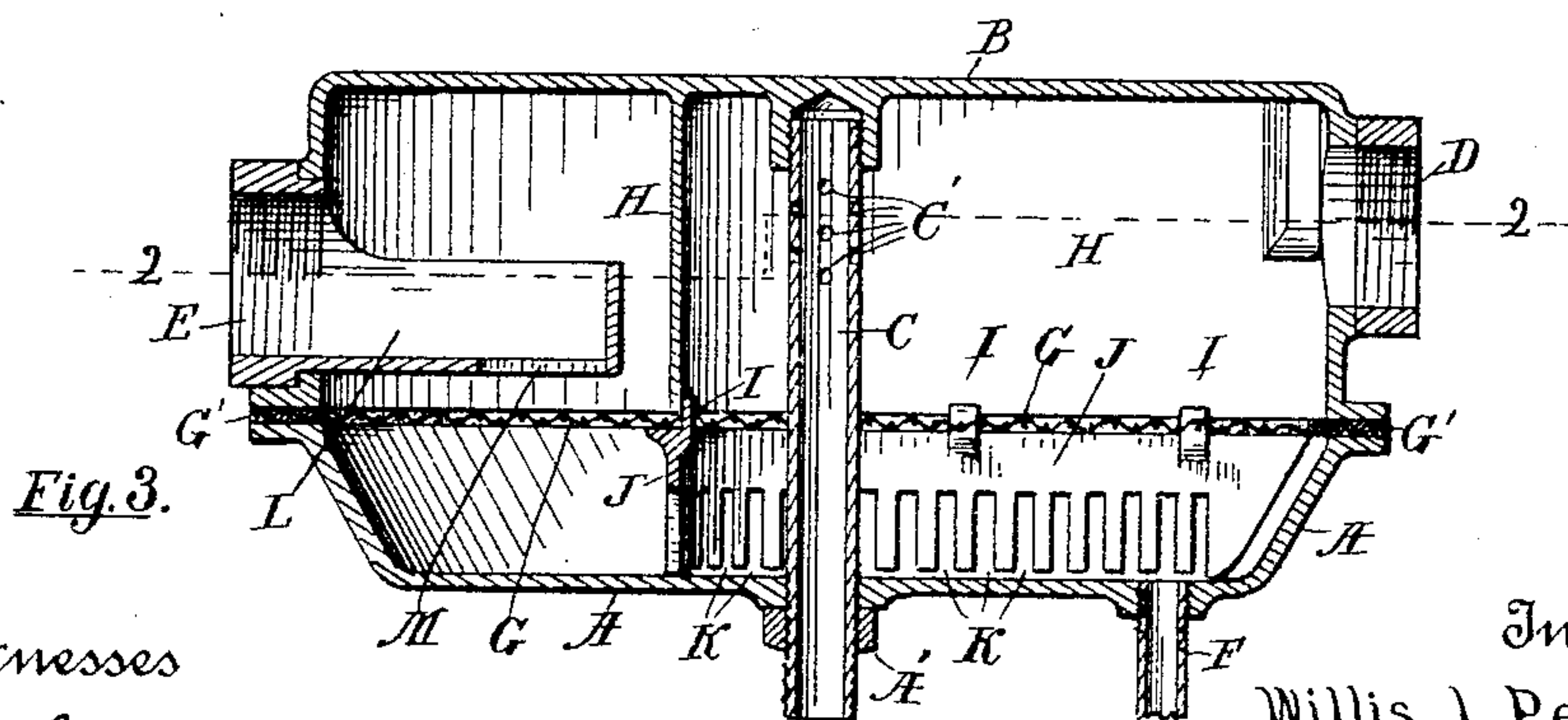


Fig. 3.

Witnesses

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EXHAUST-MUFFLER.

SPECIFICATION forming part of Letters Patent No. 765,709, dated July 26, 1904.

Application filed March 13, 1903. Serial No. 147,690. (No model.)

To all whom it may concern:

Be it known that I, WILLIS J. PERKINS, a citizen of the United States, residing at Grand Rapids, in the county of Kent and State of Michigan, have invented certain new and useful Improvements in Exhaust-Mufflers; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to improvements in exhaust-mufflers, and more particularly to mufflers adapted to be used in conjunction with explosive hydrocarbon-engines; and its object is to provide a simple, cheap, and effective device that can be readily constructed, preferably mainly of cast-iron, to provide a device easily assembled and disassembled and conveniently cast substantially without cores, and to provide the same with certain new and useful features hereinafter more fully described, and particularly pointed out in the claims.

My device consists, essentially, of a closed case cast in two parts and bolted together; a horizontal diaphragm of foraminous material, preferably a wire screen; a vertical partition dividing said case into two separate chambers, said partition also having openings near the lower side, an inlet and outlet pipe connected to the respective chambers, whereby the exhaust is received in one chamber and thence passes downward through the screen and out through said openings into the other chamber and thence upward and again through the screen, together with means for supplying water to the receiving-chamber and accumulating and retaining a certain quantity of this water in the lower portion of the case, whereby the exhaust-gases are mingled with the incoming water and then caused to pass through the accumulated water and out with the outgoing water, and in the combination and arrangement of the various parts, as will more fully appear by reference to the accompanying drawings, in which—

Figure 1 is a side elevation of a device embodying my invention; Fig. 2, a horizontal section of the same on the line 2 2 of Figs. 1

and 3; Fig. 3, a vertical section on the line 3 3 of Fig. 2, and Fig. 4 a perspective detail of the part of the partition below the screen.

Like letters refer to like parts in all of the figures.

A and B represent the respective portions of the case constituting the body of the muffler, which portions are preferably detachably secured to each other by means of flanges and screws or bolts, as shown. Between these portions and with its edges clamped between the flanges and secured thereby is arranged a horizontal diaphragm G, of foraminous material, preferably a screen of woven-wire fabric, although any suitable material having numerous openings may be used. Suitable packing G', of plastic material, is also inserted between the flanges to prevent the escape of the contents of the case. In the axis of this case is a tube or pipe C, having a number of lateral openings C' near its upper end. This pipe is preferably screw-threaded at its respective ends and engages threads in the upper portion B and nut A', and thus serves as a stay-bolt to tie the parts A and B together at the center and strengthen the same. It also serves to admit water to the upper part of the receiving-chamber in the form of spray or jets from the openings C'. This water is preferably the water used for cooling the engine and is conveyed from the engine to the pipe C by any convenient means. Such engine and conveying means being well known are not shown in the drawings.

D represents the exhaust-pipe of the engine, which pipe is connected to the upper portion of the case at one side and opens into a small receiving-chamber in the case separated from the rest of the interior by means of a vertical wall or partition composed of a portion H above the diaphragm and cast integral with the upper portion B of the case, and the portion J cast separately and located below the portion H and extending from the diaphragm to the bottom of the case and resting thereon. In the lower portion of this partition J is a series of vertical slots or openings K, through which the exhaust escapes into the other chamber of the case. This

part of the partition J may be secured in place in any convenient manner. I have shown it provided with upwardly-projecting lugs I to extend through the screen G and engage the
 5 portion H of the partition. The entire case thus consists of three parts A, B, and J, each of which can be readily cast without cores, and thus cheaply constructed and also well adapted to receive and hold the screen and
 10 also easily repaired.

Opposite the exhaust-pipe D is the outlet-pipe E, which is attached also to the upper part B of the case, but at somewhat lower level, to limit the accumulated water and to prevent
 15 its entering the exhaust-pipe when the engine is not running. This outlet-pipe E is extended inward into the interior of the case, as shown at L, and has a large opening in its upper side to permit the escape of the ex-
 20 haust downward into the same and is provided with a small bottom opening M to permit the upward escape of the accumulated water there-through.

F is a drain-pipe provided with any suitable
 25 stop-cock, (not shown,) by which the accumulated water can be drawn off as occasion requires.

The operation of this muffler is as follows: The exhaust entering at D escapes into the
 30 smaller chamber and is directed downward by the vertical partition H J and in the upper part of this chamber is intimately mixed with the jets of water escaping from the openings C'. This mixture serves to cool and somewhat
 35 condense the exhaust, which now, together with the water, passes downward through the screen G, and is thus further broken up, and thence passes through the slots K, where it is again mingled with the water, carrying the
 40 same with it into the main chamber, where the exhaust is considerably expanded, and again passes through the screen G and rises into the upper part of the said chamber, from whence it escapes outward through the pipe
 45 E. The water from the pipe C accumulates in the lower portion of the case up to the overflow-opening M and submerges the screen and lower portion J of the partition.

The screen and partition not only serve to
 50 break up and condense the exhaust, but also prevent the same from expelling the water from the device, which result is also still further accomplished by the inwardly-projecting part L of the outlet, which provides two sepa-
 55 rate exits for the water and exhaust.

Whenever the exhaust is in considerable quantity it will operate to drive a portion of the water out of the small receiving-chamber and through the openings K; but the screen
 60 and portion L of the outlet-pipe will retain the water in the main chamber up to or above the level of the screen G, and the exhaust will be forced to pass through this water and the screen, and thus be broken into small portions

and effectually cooled and condensed and the
 65 noise very materially reduced thereby and the odors absorbed and eliminated by the water.

By the described construction I am also able to use the cooling-water for the engine in the muffler also and discharge it with the exhaust,
 70 thus avoiding the need of a separate discharge for this water.

I have shown the preferred form of my invention; but it is obvious that various modifications of the same may be adopted without
 75 departing from the spirit of my invention.

What I claim, and desire to secure by Letters Patent, is—

1. In a muffler, a case, a horizontal foraminous diaphragm in the case, said case having
 80 an inlet-opening and an outlet-opening for the exhaust, and above the diaphragm, an imperforate partition between said openings, a pipe to supply water to the case, and an overflow-
 85 opening in the case and above the diaphragm to maintain water above both the lower edge of the said partition and the diaphragm.

2. In a muffler, a case, a horizontal foraminous diaphragm in the case, a vertical parti-
 90 tion in the case and extending below the diaphragm, said case having inlet and exit openings for the exhaust located at the respective sides of the partition and above the diaphragm, a pipe to supply water to the case at the inlet
 95 side of the partition, and an overflow-opening for the water located at the other side of the partition and above the diaphragm.

3. In a muffler, a case adapted to contain water in its lower part, and having an over-
 100 flow-opening to determine the water-level, a vertical partition dividing the upper part of the case and extending into the water-space of the lower part, means for supplying a stream of water to the case, a foraminous diaphragm
 105 between the upper and lower part of the case and below the overflow-opening, and inlet and exit openings for the exhaust in the upper part of the case, above the diaphragm and at the respective sides of the partition.

4. In a muffler, the combination of a case, a
 110 horizontal foraminous diaphragm in the case, a vertical partition extending from top to bottom of the case and having a series of openings below the diaphragm, and said case having inlet and exit openings at the respective sides
 115 of the partition and above the diaphragm.

5. In a muffler, a case divided horizontally into two parts, a horizontal foraminous diaphragm clamped at the edges between the two
 120 parts, an imperforate partition above the diaphragm, a partition below the diaphragm and having a series of openings, said case having an inlet-opening at one side of the partition, and an exit-opening at the other side of the
 125 partition.

6. In a muffler, a case divided horizontally into two separate parts, means for detachably
 securing said parts to each other, a pipe in the

axis of the case, and connecting the said parts, and also having lateral openings near the top, a foraminous diaphragm in the case, a partition in the case extending both above and below the diaphragm, and dividing the case into two chambers, and also having openings in its lower part, an inlet-pipe opening into one chamber, and an exit-pipe opening into the other chamber.

7. In a muffler, a case, a foraminous diaphragm dividing the case horizontally, a vertical partition in the case and extending both above and below the diaphragm and having openings in its lower part, a water-pipe opening into the upper part of the case at one side of the vertical partition, an exhaust-inlet opening in the top of the case at the same side of the partition, and an exit and overflow pipe opening in the case at the other side of the partition.

8. In a muffler, a case, a horizontal foraminous diaphragm in the case, a vertical partition in the case, extending both above and below the diaphragm and having openings in its lower part, a pipe to admit water to the case, said case having an exhaust-inlet opening at one side of the vertical partition, and an exit-pipe projecting into the case, and open at its upper side to receive the exhaust, and having an opening in its lower side for escape of the water.

9. In a muffler, a case divided horizontally, and detachably connected, a partition a portion of which is integral with one part of the case, a separate piece completing the partition

and having slots extending upward from its lower edge, and means for retaining the lower portion of the partition in place.

10. In a muffler, a case, a foraminous diaphragm extending horizontally across the case, a partition extending from the top of the case to near the bottom of the same and below the diaphragm, means for supplying water to the case, said case having an inlet for the exhaust near the top and an outlet-pipe opposite the inlet-pipe and extended inward within the case and having an upper opening for escape of the exhaust and a lower opening for escape of the water.

11. In a muffler, a case divided horizontally and connected by flanges and screws, a woven-wire screen dividing the interior of the case and clamped between the flanges, a vertical partition above the screen and integral with the upper part of the case, a vertical partition below the screen and having slotted openings in its lower edge and upwardly-projecting lugs, an inlet-pipe connected to the upper part of the case, and an outlet-pipe projecting into the case and having an upper opening for escape of the exhaust and a lower opening for escape of water, and a pipe in the axis of the case and having lateral openings near its upper end.

In testimony whereof I affix my signature in presence of two witnesses.

WILLIS J. PERKINS.

Witnesses:

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PALMER A. JONES.